

# 10<sup>th</sup> International Conference on **CANCER STEM CELLS AND ONCOLOGY RESEARCH**

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### **Are cancer stem cells really healthy cells being reprogrammed back to a naïve stem cell state?**

The intersecting space between stem cells and cancer stem cells is rapidly expanding. Many of the markers, previously thought to be stem cell markers, are now being shown to be markers of metastasis as well. Similarly, metastatic markers such as CXCR4, have now been shown to be markers of the earliest stem cells, called 'naïve' stem cells. Here, we report the discovery of a novel stem cell growth factor, NME7-AB, that induces human stem cells to revert to the earliest naïve state. NME7-AB is naturally expressed in every cell of a human Day 3 morula, but by Day 5 is only expressed in the cells of the inner cell mass, which are naïve by definition. Although this new growth factor should be turned off for adult life, we have found it expressed in nearly every metastatic tissue we have examined. *In vitro* and *in vivo*, NME7-AB induces cancer cells to become more metastatic; they upregulate metastatic markers and form tumors in mice from as few as 50 cells. Daily injections of NME7-AB into the tumor-bearing mice caused the solid tumor cancers to metastasize. These data are consistent with the idea that cancer cells are being reprogrammed back to a stem cell-like state, wherein the metastatic cancer cells, aka cancer stem cells, are reverted all the way back to the naïve stem cell state. These data suggest that agents that inhibit naïve stem cell pluripotency or growth will also be inhibitors of cancer cells and, more particularly, cancer stem cells.

### **Biography**

Cynthia Bamdad holds a BS in Physics from Northeastern University and a PhD in Biophysics from Harvard University. As a PhD candidate and without the benefit of an advisor, she invented the first electronic DNA chip that she commercialized at a California startup, which was then sold to Motorola for \$300M; the chip is now the core of an FDA-approved diagnostic device marketed by Genmark. She is sole or lead inventor on over a hundred patent applications, including for novel technologies that enabled Minerva Biotechnologies' groundbreaking discoveries in basic cancer biology.

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